REMARKS

Applicants respectfully request consideration/acknowledgement of the Information Disclosure Statement submitted October 14, 2008 (which appears in the PAIR image file wrapper).

In the Office Action, the Examiner rejected claims 1-28 pursuant to 35 U.S.C. §103(a) as unpatentable over Hall, et al. (U.S. Patent No.6,071,240) in view of Hollman, et al. (Coherence Factor of Speckle . . .). Claims 30-34 were rejected pursuant to 35 U.S.C. §103(a) as unpatentable over Hall, et al. in view of Hollman, et al. and further in view of Rigby (U.S. Patent No. 5,910,115). Applicants respectfully request reconsideration of the rejections of claims 1-28 and 30-34, including independent claims 1, 13, 16, 27, 30 and 34.

Independent claim 1 recites obtaining data from a plurality of transducer elements across a receive aperture, determining a coherence factor as a function of the data across the receive aperture, and setting a beamforming parameter as a function of the coherence factor.

As noted by the Examiner, Hall, et al. do not disclose setting a beamforming parameter as a function of the coherence factor. Instead, Hall, et al., suppress incoherent data by adjusting signal amplitude (abstract; col. 3, lines 5-18; col. 7, lines 30-32; and col. 9, lines 1-8).

Hollman, et al. are relied on to suggest adjusting the beamformer parameters shown in Hall, et al. Hollman, et al. show that coherence factor relates to image quality (abstract; and page 1260, col. 1). To test the relationship between coherence factor and image quality, a phase distortion is introduced and may be corrected iteratively (page 1259). Hollman, et al. teach that the coherence factor is an independent measure of image quality, but do not show setting a beamforming parameter as a function of the coherence factor.

Both Hollman, et al. and Hall, et al. fail to disclose the same limitation. Neither reference discloses setting a beamforming parameter as a function of the coherence factor, so prima facie obviousness has not been shown.

A person of ordinary skill in that art would not have set a beamforming parameter as a function of the coherence factor based on the teachings of Hall, et al. and Hollman, et al. Neither reference discloses this. Hall, et al., like Hollman, et al., recognize that incoherence reduces image quality (col. 2, lines 25-54). Hall, et al. mention beamforming (col. 1, lines 30 – col. 2, line 15), but does not suggest altering the beamforming parameters. Instead, Hall, et al. alter signal amplitude to increase image quality. A person of ordinary skill in the art, given the same relationship (coherence

factor to image quality) noted in both Hall, et al. and Hallman, et al., would have used the solution of adjusting signal amplitude taught by Hall, et al. Both references note a same problem, and Hall, et al. provide a solution. A person of ordinary skill in the art would use the solution of Hall, et al., not some other solution not disclosed in either reference.

Independent claim 13 recites a beamformer parameter responsive to the coherence factor. Claim 13 is allowable for similar reasons as claim 1.

Independent claim 16 recites setting an image forming parameter as a function of the coherence factor, the image forming parameter being for synthesis, multibeam, a number of sequential beams, a number of sub-apertures, a number of focal zones or combinations thereof.

As noted above, Hall, et al. suppress or change the amplitude based on the coherent and incoherent sum comparison. The coherent sum, incoherent sum, or a combination of both may be used for the image. As noted by the Examiner, Hall, et al. do not disclose the image forming parameters of claim 16 being a function of the coherence factor.

Hollman, et al. relate image quality to coherence factor as a test of quality. Phase may be manipulated to adjust coherence. The change in coherence alters image quality. Hollman, et al. do not disclose the image forming parameters listed in claim 16, and do not disclose setting the parameters as a function of coherence factor.

Both Hall, et al. and Hollman, et al. fail to disclose the recited image forming parameters, so claim 16 is allowable. A person of ordinary skill in the art would use the amplitude adjustment of Hall, et al., not the listed image forming parameters, based on the coherence factor since Hollman, et al. provide a relationship with quality and Hall, et al. use amplitude as the solution to the same problem.

Independent claim 27 is allowable for similar reasons as claim 16.

Independent claim 30 recites setting dynamic range, a nonlinear filter, or a nonlinear map as a function of the coherence factor. As noted by the Examiner, Hall, et al. and Hollman, et al. do not set a non-linear map as a function of the coherence factor.

Rigby, like Hall, et al., does not disclose these limitations. Hall, et al. is a CIP of Rigby and generally includes the same information cited in Rigby. Since Hall, et al. do not disclose these limitations, the parent patent Rigby does not.

The cited portion (col. 5, line 26 - col. 6, line 15) of Rigby discloses mapping the coherence factor (see col. 5, lines 39-47 in particular). The mapping outputs a value for a display pixel based on an input coherence factor. Rigby and Hall, et al. use a map to map coherence factor, but do not set the map as a function of the coherence factor. One of different maps and dynamic range are not set based on coherence factor. Rigby does not disclose the limitations of claim 30.

Independent claim 34 is allowable for the same reasons as discussed above for claim 30.

Dependent claims 2-12, 14-15, 17-26, 28, and 31-33 depend from one of the independent claims discussed above, so are allowable for the same reasons. Further limitations distinguish from Ustuner, et al.

Claims 3 and 19 recite calculating phase variance across transducer elements. Hall, et al. use beam sum to determine coherence, and do not calculate phase variance. Col. 6 shows beamforming and col. 7 shows using coherent data, which has phase information. Neither shows calculating phase variance. Hollman, et al. use beam sum, not phase variance, to determine the coherence factor.

Claims 5-10, 12, 15, 17, 21-26, and 31-33 all recite specific parameters set as a function of the coherence factor. Hall, et al., Hollman, et al. and Rigby may use some of these parameters in general, but do not set them as a function of the coherence factor. Hall, et al. and Rigby teach a feed-forward system that changes amplitude or not based on coherence. Hollman, et al. relate quality to coherence.

Claim 11 is allowable for the same reason as claim 16.

CONCLUSION

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof.

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